

## ONTARIO CENTRE FOR RESOURCE RECOVERY

This includes a unique experimental plant and allied administrative and laboratory facilities. The plant serves both as a part of Metro Toronto's solid waste disposal system and as a sophisticated research facility.

This new facility will:

- Provide much needed facts about the technology and the economics of reclamation.
- Supply recovered materials for industry to find new ways to use them.
- Train operators of future resource recovery plants.

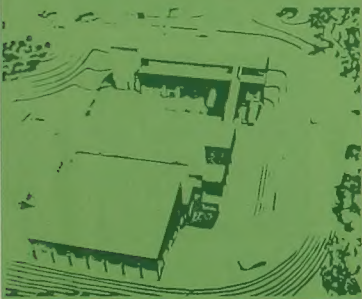
The plant, the heart of the Ontario Centre for Resource Recovery, on Vanley Drive, Downsview, in Metropolitan Toronto, consists of five buildings:

- The scale house.
- The transfer and paper recovery building.
- The shredding and air classification building.
- The material processing and energy recovery building.
- The composting building.

## OTHER EQUIPMENT

Sophisticated instruments, including closed circuit TV cameras, watch all less accessible points in the system and gather data in a computer for studies of the operation. Automatic gates allow the sampling of the material at all stages of the process, for analysis in the plant's laboratories.

Front-bladed tractors and fork-lift trucks are provided for waste and product handling, and a mobile sweeper keeps floor areas clean.

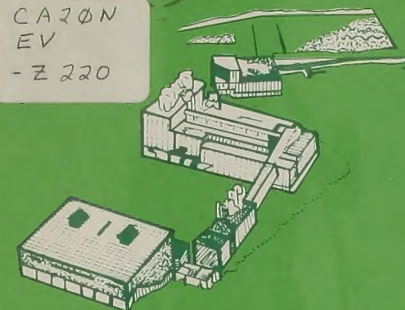


Published by  
Information Services Branch  
135 St. Clair Avenue West  
Toronto, Ontario  
M4V 1P5

## Ontario Centre for Resource Recovery



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Ontario

Ministry  
of the  
Environment

Hon. George A. Kerr, O.C.  
Minister  
K. H. Sharpe  
Deputy Minister



Ontario

# nature's way

When a tree dies in the forest, the rotting trunk is for a while host to thousands of creatures. By living they help to reduce the old wood to nature's basic building blocks. Every one will reappear to fulfil some useful function.

This is the way nature deals with waste.

It's

## RECYCLING

Nature's recycling systems are efficient, but they can't deal with the kinds of waste, or the vast quantities of waste, produced by modern man.

In Ontario we generate more than 6,500,000 tons of garbage each year, and this flood of waste is growing.

To meet this challenge, the Ontario Government through the Ministry of the Environment, has initiated a long-term, comprehensive Waste Management and Resource Recovery Program with four objectives.

- To decrease the quantity of solid waste.
- To reduce the amount of land now required for sanitary landfill.
- To reclaim all of the resources possible from our garbage.
- To develop means to re-use the material in recycled products.

The Ministry is now working with municipalities to improve their waste management systems and develop means of recovering the energy and material resources from waste instead of discarding it.

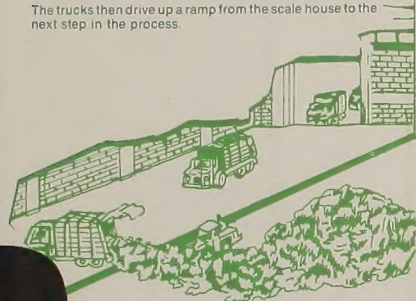
To carry out this program Environment Ontario has set up the

## THE SCALE HOUSE

Normal household, commercial and industrial waste arrives at the scale house in the usual collection trucks.

Each truck is registered and weighed in about 15 seconds. The memory banks of an in-house computer store this information together with information gathered at many locations throughout the plant. In this way the recovery process can be monitored and improved continuously.

The trucks then drive up a ramp from the scale house to the next step in the process.



## TRANSFER AND PAPER RECOVERY BUILDING

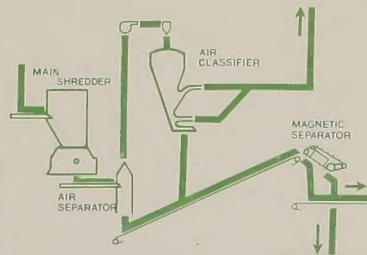
This is where the recycling process starts.

One of the ten lanes in the enclosed and well-ventilated receiving building is reserved for loads containing mostly cardboard or banded paper. To save time and paper quality, this waste is fed directly to a baler, baled and made available to users of recycled paper.

Up to 300 tons of garbage — including appliances, furniture, old tires and the thousands of other items our society discards — can be processed through the recovery system in eight hours, or 600 tons daily in two shifts.

As much as 600 tons more can be compacted, transferred into long haul trucks and delivered to one of Metropolitan Toronto's landfill sites. Rejected material from the recovery process is added to this transfer stream.

The main stream of recoverable waste flows on large conveyor belts to reclamation processing.



## SHREDDING AND CLASSIFICATION BUILDING

The powerful main shredder can break up the waste, including stoves and refrigerators, into pieces smaller than 6 inches at a rate of 40 tons per hour. It is enclosed in a separate building and is designed to minimize any possible hazards.

As the shredded garbage moves on, a strong airstream in the air separator lifts the shredded waste to divide it into two parts: a light fraction of paper, light plastic and similar material in one stream and a heavy fraction including glass, metal and organic material in the other. The light materials are further treated in a density classifier to remove any heavier material still left. The paper and plastics are then delivered to a clean fibre storage bin.

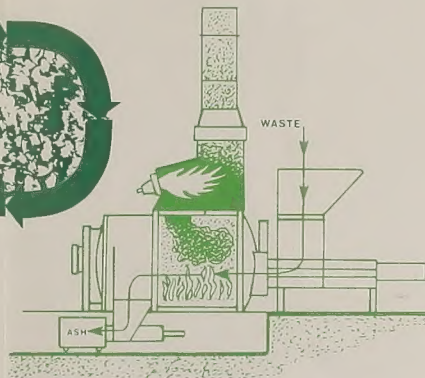
## MATERIAL PROCESSING AND ENERGY RECOVERY BUILDING

The heavy fraction continues through the process — first to a magnetic separator that removes iron and steel, and then to a manual separation station. There the possibility of recovering non-ferrous metals such as lead, copper and aluminum will be evaluated.

In this way magnetic and non-magnetic metals can be sorted and sent separately to storage bins for later delivery to users.

The remaining heavy fraction, consisting mainly of organic particles and glass, is fed to the next stage of processing.

Here a large, 20-foot-long revolving screen removes glass, ceramics and other fine materials from the flow.



This fine glass-rich fraction is cleaned in an air classifier and sent to a storage bin where it is available to industry to study different ways to use it.

The remaining waste is shredded again to particles smaller than 2 inches. Another air separator removes all heavy materials left and sends this reject residue to storage for final disposal in landfill.

The remaining organic material ends its journey in an organic materials storage bin and is drawn from here for composting, or burning as fuel in the resource recovery plant's energy recovery incinerator.

The light fraction, paper and plastics from the other storage bin, is baled and may be burned as fuel or used for paper production. Cattle bedding, cellulose insulation, and sewage sludge conditioning are other possible uses being investigated.

## THE COMPOSTING BUILDING

Here the resource recovery process is left to natural agents — bacteria. They transform the recovered organic materials, mixed with sewage sludge delivered to the plant, to compost.

The transformation goes on constantly in an aerated digesting tank, in which bacteria can continuously produce about 250 tons of compost in a 58-foot diameter digester in a five-day cycle.

## POLLUTION CONTROL

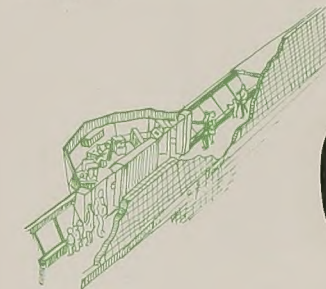
The dry recovery process generates no liquid waste. Drainage from floors and toilets flows into the sanitary sewers for treatment in Metropolitan Toronto's sewage treatment system.

Noise is controlled by vibration damping of all equipment. All large machinery, such as shredders and classifiers, is isolated from areas used by staff and visitors.

An extensive air control system keeps the air in the plant clean. Crucial material transfer points are hooded and air ducts draw off dust-laden process air. This air is collected and filtered in numerous pulse-jet baghouses.

The design of the solid waste-fired heating unit assures that Ontario's stringent air pollution standards are met.

Like other parts of the process, these systems are monitored to provide data for the design of future resource recovery systems.



## PRODUCTS

The following products are available from the resource recovery plant at this stage:

- baled cardboard and paper
- baled shredded mixed paper
- bulk shredded paper and organic fibre
- bulk organic compost
- bulk glass
- bulk ferrous metals
- bulk process rejects

The plant has been designed so that new processes can be added in the future to produce different products.

But the most important product of Environment Ontario's Centre for Resource Recovery will be the information available from research into recycling. This information will be made freely available and may very well show us the way toward a blending of recovery with the production and the use of materials. And this knowledge will bring us closer to the complete recovery of all material as it is operating in nature's recycling process.